AMENDMENTS TO THE CLAIMS

1. (currently amended) A [[M]]method for controlling additions of powder materials into an electrolytic cell ~~(1)~~ designed for the production of aluminium by fused bath electrolysis and provided with at least one powder material distributor ~~(20)~~ and at least one boring device ~~(30)~~ comprising an actuator ~~(31)~~ and a crustbreaker ~~(33)~~, ~~the~~ said cell containing a liquid electrolyte bath ~~(7)~~ and being operated such that an alumina and solidified bath crust ~~(10)~~ is formed above the liquid electrolyte bath ~~(7)~~, ~~method in which~~ wherein at least one opening ~~(11)~~ is formed in ~~the~~ said crust ~~(10)~~ using the boring device ~~(30)~~ and powder material is added through at least one opening ~~(11)~~ using a determined procedure for introducing additions in the bath, ~~referred to by the expression "normal feed procedure",~~ and ~~characterized in that~~ further wherein:

- providing the boring device with at least one position detector capable of detecting at least one determined low position,
- at a determined time t_0, generating an electrical signal ~~S is generated~~ to provoke lowering of the crustbreaker ~~(33)~~ using the actuator ~~(31)~~,
- measuring the moment [[t]] at which the crustbreaker ~~(33)~~ reaches a predetermined low position ~~P is measured~~,
- determining the value of at least one powder material feed operation indicator ~~is determined~~, using a function ~~$F(t_0, t)$~~,
- using at least one operation criterion and the value of the operation indicator~~(s) F are used~~ to determine whether ~~or not~~ an operation is abnormal,
- if the operation is not considered to be abnormal, ~~the normal feed~~ maintaining said determined procedure ~~is maintained~~,
- if operation is considered to be abnormal, triggering at least one correction procedure ~~called a "regularisation / normalisation" procedure is triggered,~~ that can restore ~~normal~~ operation of the powder material feed.

2. (currently amended) A [[C]]control method according to claim 1, ~~characterised in that~~ wherein an operation indicator is given by a descent duration D ~~difference~~ that is equal to a function ~~F(t-t$_0$), called the "descent duration" D~~ of the difference between a time t_0 and a time t.

3. (currently amended) A [[C]]control method according to claim 2, ~~characterised in that~~ wherein operation is considered to be abnormal if the descent duration D is higher than a determined high threshold Sh, in at least Nh successive determinations.

4. (currently amended) A [[C]]control method according to claim 3, ~~characterised in that~~ wherein Nh is an integer number ~~between~~ from 1 ~~and~~ to 10 inclusively.

5. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 2 ~~to 4~~, ~~characterised in that~~ wherein operation is considered to be abnormal if the descent duration is longer than a determined threshold Sh' determined in at least Nh' determinations out of N, ~~in other words if~~ such that the ratio Nh'/N is more than a given value Rh.

6. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] ~~3 to~~ 5, ~~characterised in that~~ wherein the ~~thresholds Sh and~~ threshold Sh' are equal to a fixed value or a value calculated using several values for the duration D, that are successive or separated by intermediate values.

7. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 2 ~~to 6~~, ~~characterised in that~~ wherein operation is considered to be abnormal if the descent duration is less than a determined low threshold Sb in at least Nb successive determinations.

8. (currently amended) A [[C]]control method according to claim 7, ~~characterised in that~~ wherein Nb is an integer number from 1 to 10 inclusively.

9. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 2 ~~1 to 8~~, ~~characterised in that~~ wherein operation is considered to be abnormal if ~~the~~ time t cannot be measured after a time T exceeding a maximum determined threshold Tmax.

10. (currently amended) A [[C]]control method according to claim 9, ~~characterised in that~~ wherein the threshold Tmax is ~~between~~ from 5 ~~and~~ to 15 seconds.

11. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 1 ~~to 10~~, ~~characterised in that~~ wherein an operation indicator, ~~called the drift indicator,~~ is determined from a deviation E between at least two values of the duration D, either successive or separated by intermediate values.

12. (currently amended) A [[C]]ontrol method according to claim 11, ~~characterised in that the~~ wherein said deviation E is given by ~~the~~ an algebraic difference between two successive values of the duration D or two values separated by intermediate values.

13. (currently amended) A [[C]]control method according to claim 11, ~~characterised in that the~~ wherein said deviation E is given by a mean deviation or a statistical deviation between at least three successive values of the duration D, or three values separated by intermediate values.

14. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 11 ~~to 13~~, ~~characterised in that~~ wherein operation is considered to be abnormal when ~~the~~ said deviation E is greater than a determined threshold Se.

15. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 1 ~~to 14~~, ~~characterised in that the~~ wherein said ~~regularisation / normalisation~~ correction procedure comprises at least one automatic or manual action to correct operation of the boring device ~~(30)~~.

16. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 1 ~~to 15~~, ~~characterised in that~~ wherein the cell ~~(1)~~ comprises at least two boring devices ~~(30)~~ each associated with a distinct powder material distributor, ~~(20)~~ and ~~in that~~ further wherein the ~~regularisation / normalisation~~ correction procedure includes an at least temporary interruption of the feed by the distributor associated with the boring device for which operation is considered to be abnormal.

17. (currently amended) A [[C]]control method according to claim 16, ~~characterised in that it~~ wherein said method comprises distributing the feed of powder material on ~~the other~~ another distributor~~(s)~~ in the cell.

18. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 1 ~~to 17~~, ~~characterised in that~~ wherein when operation of at least one boring device ~~(30)~~ is considered to be abnormal, the control method also comprises a modification of the ~~normal feed~~ determined procedure.

19. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 1 ~~to 18~~, ~~characterised in that~~ wherein the determined low position is ~~the~~ a position at which the crustbreaker ~~(33)~~ comes into contact with the liquid electrolyte bath ~~(7)~~.

20. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 1 ~~to 18~~, ~~characterised in that~~ wherein the determined low position is ~~the~~ a lowest position allowed by the actuator ~~(31)~~.

21. (currently amended) A [[C]]control method according to claim ~~21~~ 1, ~~characterised in that~~ wherein the boring device or each boring device ~~(30)~~ comprises at least one jack fitted with ~~the~~ said position detector ~~(40)~~.

22. (currently amended) A [[C]]control method according to claim 21, ~~characterised in that~~ ~~the~~ wherein said detector ~~(40)~~ is a stroke end detector.

23. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] ~~21 to 23~~ 1, ~~characterised in that~~ wherein the position detector ~~(40)~~ is ~~chosen from among~~ at least one selected from the group consisting of mechanical detectors, electrical detectors, optical detectors, ~~or~~ magnetic detectors, and detectors comprising any combination ~~of these means~~ thereof.

24. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 1 ~~to 24~~, ~~characterised in that~~ wherein the electrical signal [[S]] transmits the crustbreaker lowering order electrically, optically, and/or pneumatically.

25. (currently amended) A [[C]]control method according to ~~any one of~~ claim[[s]] 1 ~~to 25~~, ~~characterised in that~~ wherein said powder materials are ~~chosen~~ selected from ~~among~~ the group ~~including~~ consisting of alumina based powders, aluminium fluoride powders ~~or~~ and cryolite based powders.

26. (currently amended) A control [[S]]system ~~(50)~~ for controlling additions of powder materials into an electrolytic cell ~~(1)~~ designed for the production of aluminium by fused bath electrolysis and provided with at least one powder material distributor ~~(20)~~ and at least one boring device ~~(30)~~ comprising an actuator ~~(31)~~ and a crustbreaker ~~(33)~~, ~~the~~ said cell containing a liquid electrolyte bath ~~(7)~~ and being operated so as to form an alumina and solidified bath crust ~~(10)~~ above ~~the~~ a liquid electrolyte bath ~~(7)~~, ~~characterized in that it~~ wherein said system comprises:

- a means ~~(51)~~ of generating an electrical signal [[S]] capable of causing the crustbreaker ~~(33)~~ to be lowered by means of the actuator ~~(31)~~ at a determined time t_0,
- a device ~~(52)~~ for measuring the moment t at which the crustbreaker ~~(33)~~ reaches a determined low position [[P]], said device comprising at least one position detector capable of detecting said determined low position,

- a ~~means (53) called a~~ diagnostic means of determining the value of at least one feed operation indicator ~~F(t_0, t)~~ starting from ~~the~~ a value of ~~the~~ time t_0 and ~~the~~ a value obtained for ~~the~~ time t.

27. (currently amended) A [[C]]control system ~~(50)~~ according to claim ~~28~~ 26, ~~characterised in that the~~ wherein said detector ~~(40)~~ is integrated into the boring device~~(s) (30)~~.

28. (currently amended) A [[C]]control system ~~(50)~~ according to claim 27, ~~characterised in that the~~ wherein said detector ~~(40)~~ is integrated into ~~the~~ said actuator ~~(31)~~ in each boring device ~~(30)~~.

29. (currently amended) A [[C]]control system ~~(50)~~ according to claim 28, ~~characterised in that~~ wherein the actuator ~~(31)~~ comprises a jack fitted with ~~the~~ said detector ~~(40)~~.

30. (currently amended) A [[C]]control system ~~(50)~~ according to ~~any one of~~ claim[[s]] ~~28 to 31~~ 26, ~~characterised in that the~~ wherein said detector ~~(40)~~ is a stroke end detector.

31. (currently amended) A [[C]]control system ~~(50)~~ according to ~~any one of~~ claim[[s]] ~~28 to 32~~ 26, ~~characterised in that~~ wherein the detector ~~(40)~~ is ~~chosen~~ at least one selected from ~~among~~ the group consisting of mechanical detector, electrical detector, optical detector, ~~or~~ magnetic detectors, and detectors comprising any combination ~~of these means~~ thereof.

32. (currently amended) A [[C]]control system ~~(50)~~ according to ~~any one of~~ claim[[s]] 26 ~~to 33~~, ~~characterised in that~~ wherein the control system ~~(50) according to the invention~~ comprises a regulator ~~(54)~~.

33. (currently amended) A [[C]]control system ~~(50)~~ according to ~~any~~ claim 32, ~~characterised in that~~ wherein the regulator ~~(54)~~ comprises specific means of implementing ~~the~~ automatic

actions intended to correct operation of [[a]] said boring device ~~(30)~~ when an operation indicator ~~$F(t_0, t)$~~ reveals abnormal operation of the feed.

34. (currently amended) A [[C]]control system ~~(50)~~ according to ~~any one of~~ claim[[s]] 26 ~~to~~ ~~35~~, ~~characterised in that~~ wherein said powder materials are ~~chosen~~ selected from ~~among~~ the group ~~including~~ consisting of alumina based powders, aluminium fluoride powders ~~or~~ and cryolite based powders.

35. (new) A control method according to claim 3, wherein the threshold Sh are equal to a fixed value or a value calculated using several values for the duration D, that are successive or separated by intermediate values.